DOCUMENT RESUME

ED 039 556 CG 005 341

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TITLE The Effects of Conceptual Structure and Personal Quality of Feedback on Motivation.
INSTITUTION Illinois Univ., Urbana. Coll. of Education.
PUB DATE [70]
NOTE 12p.

EDRS PRICE EDRS Price MF-$0.25 HC-$0.70
DESCRIPTORS *Concept Formation, *Feedback, *High School Students, *Motivation, Negro Students, Performance Factors, *Performance Tests, Persistence, Personal Relationship, Social Differences

ABSTRACT

The purpose of this study was to determine how subjects (high school students) of varying conceptual structure (Harvey, Hunt, and Schroder, 1961) would respond to personal and impersonal feedback on a performance task. It was predicted that whereas abstract subjects would show no difference in motivation under the two feedback conditions, concrete subjects would show increased motivation when administered personal feedback. These predictions were confirmed and it was suggested therewith that Conceptual Systems Theory may provide a logical basis for interpreting empirical findings related to social class differences in responding to performance feedback. (Author)

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THE EFFECTS OF CONCEPTUAL STRUCTURE AND PERSONAL QUALITY OF FEEDBACK ON MOTIVATION

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In theories of conceptual development it is commonly assumed that the individual's conceptual structure normally develops from very simple to highly complex structures. Unique dynamic effects of such development are implicit in a theory proposed by Harvey, Hunt and Schroder (1961; Schroder, Driver, and Streufert, 1967). Briefly, these researchers have not only described conceptual functioning during sequential stages of development, they have also suggested how this functioning interacts with differing environments producing predictable behavioral reactions.

An aspect of the environment of some import is the quality or nature of feedback administered to a person in a performance situation. There are, of course, many ways in which this feedback may vary. However, one of the more obvious ways is in terms of what might be termed an "impersonality dimension." Knowledge of results can be given impersonally, perhaps mechanically, or it can take the form of a warm evaluative response from some significant other. Considerable recent research has explored the effects of such feedback variation on middle and lower class children and found, in general, that the middle class child is more readily motivated by sheer knowledge of correctness of outcome than is the lower class child. The lower class child is more readily motivated by personal-evaluation feedback. In interpreting this finding Zigler and Child (1969) suggest that the most satisfying explanation is a developmental one. According to such an explanation the effectiveness of correctness as a reinforcer is dependent on a more mature or complex level of functioning. Thus it is the middle class child's advanced development that makes sheer correctness an effective reinforcer. The conceptual systems theory proposed by Harvey, Hunt and Schroder would seem to make a further suggestion in this regard, namely that not only retardation but fixation in development can and often does occur. Thus some individuals might continue to prefer more concrete and evaluative feedback through adolescence to adulthood; others would attain another mode of functioning and be less affected by the quality of the feedback as long as its informative value did not vary. In sum, Conceptual Systems Theory would seem to suggest that observed social class differences in response to feedback may be rooted in patterns of personality development--patterns which are retained, in many cases, beyond childhood.

It was the goal of the present study to test the validity of this deduction from Conceptual Systems Theory. Heretofore, it has not been demonstrated that Ss of different conceptual structures respond differently to different feedback. Clearly implied in the theory is that Ss having a simple structure (concrete) should show a difference in performance under personal-evaluative and impersonal feedback conditions. Whereas individuals having a complex structure (abstract) should show little or no change in performance under varying feedback conditions, concrete Ss could be expected to be more affected by such environmental shift (cf. Suedfeld, 1964). Furthermore, the theory predicts the direction

of influence in the case of concrete Ss. Concrete Ss should show a clear preference for personal-evaluative feedback whereas for abstract Ss correctness is correctness regardless of source.

In order to test the predictions "personal" and "impersonal" feedback on a binary response task was administered to concrete and abstract high school Ss with voluntary persistence at the task serving as the dependent variable. It was predicted that concrete Ss would persist longer under personal than impersonal conditions but that abstract Ss would exhibit no (significant) differences in this regard.

Method

Subjects

Eighty-four junior male public high school students (ages 16-18) served as Ss. Seventy-six were white and of mixed socioeconomic background. Data from eight black students were treated separately from the white sample because of suspected effects of the race of the experimenter (Rosenthal, 1966).

Measurement of Conceptual Structure

Conceptual structure was measured by the Sentence Completion Test (SCT), which is more thoroughly described in Schroder et al. (1967). Briefly, this semiprojective test required Ss to respond to each of six paragraph stems by writing on each for 2 minutes. The protocols were then rated according to the level of concreteness-abstractness displayed in the responses.[2] On the basis of the ratings, which ranged from conrete to mildly abstract, Ss were divided into "concrete" and "abstract" groups.

Experimental Task

An experimental task employed by Maehr and Videbeck (1968) was adapted for use in the present study. The task consisted of parallel lists of 140 foreign dialect words and English words printed in pairs on a paper roll and presented one pair at a time through a slot in the center of a 44- by 32-inch Masonite board sitting on a table. For each pair of words S was asked to indicate whether he thought the English word was "a reasonable equivalent of the foreign word" by pushing one of two response buttons. The E immediately provided feedback regarding the "correctness" of the response. The correct-incorrect feedback was not actually contingent on the quality of S's response. Rather, it was determined that each S would be "correct" 65% of the time regardless of his responses, with the order of "correct" feedback being randomly determined.

Experimental Procedure

Prospective subjects were contacted and asked if they would be willing to spend approximately 1 1/2 hours of study hall time to participate in a "high school student opinion survey" and a "language project." Approximately two-thirds of the boys contacted volunteered to participate. Four days after Ss were enlisted, the SCT was administered along with other personality questionnaires. Beginning the week following the administration of the SCT and continuing for four weeks thereafter, the language task was administered to each S individually during his study hall period. Only if Ss indicated that they had time immediately available for participating were they asked to work the task.

In the task instructions the nature of the project was explained as being "part of an ongoing research project in psycholinguistics" and that the purpose was for "determining whether or not a person who has no knowledge of a language can make better than chance guesses regarding the meaning of certain words in that language." The fact that the task was not a test of ability and that individual performances would not be revealed to the school faculty or administration was emphasized.

When the instructions were completed Ss were informed that they did not have to work all the trials but should work only as long as they wished. The actual words E used to convey the idea were as follows:

> Since it is possible to determine how much knowledge you have of the foreign language from a sample of your performance, you may quit whenever you feel you have worked all the items you would like. From a portion of the work you do we are able to tell about how much you know of this language, so whenever you feel that you have worked all the items you care to work, you are free to quit at any time. Just let me know when you've done all you like. It's completely up to you.

After S has responded to ten of the word pairs he was again reminded that he was free to quit whenever he wished. The task terminated when S expressed the desire to quit or worked through all 140 pairs of words.

Each S performed the task under either a personal feedback condition or an impersonal feedback condition to which he had been randomly assigned. Under the two conditions only the quality of feedback given to responses on the task trials varied.

Personal feedback was administered in the following manner. The S and E were seated across the corner of the table on which the apparatus for presenting the task was placed. When administering feedback

for "correct" responses, E uttered one of the following statements: "Right!" "You're right." "Okay, right." "You're right again!" "Uh huh, that's good." "Okay, good." "All right, that's good." Statements uttered for "incorrect" responses were the following: "That's not right." "No, that one's not right." "Mmm, you missed that one." "That one you missed." In addition, E addressed S by his first name randomly in one-tenth of the feedback utterances he made and attempted to react empathetically to the reactions made by S while working the task. If S's mood seemed to be serious, E also tried to maintain a somewhat serious, though not sullen attitude. If S seemed to take the task lightly, E tried to respond in a lighter, though not flippant or carefree manner.

In the case of impersonal feedback S faced the apparatus on the table while E moved behind the apparatus, across the table and out of sight of S. After S indicated his response to each trial, E indicated to him whether his response was "correct" by switching on one of two reinforcement lights labeled either "RIGHT" or "NOT RIGHT" for approximately one second. The E administered no other type of feedback on the task trials.

Results

The independent variables defined by the hypothesis are concrete-abstract conceptual structure and personal-impersonal feedback. The dependent variable is the persistence score, indicated by the number of task trials completed. A description of the distribution of persistence scores is presented in Table 1, where it is seem that the scores are not normally distributed. The ceiling effect which appears (39 percent of the Ss completed all trials) was not anticipated since in previous use of the task (with college Ss) few Ss worked all possible trials. The means and standard deviations of task trials completed under the experimental conditions are presented in Table 2.

Tables 1 and 2 about here

The results in Table 2 indicate that the different patterns of persistence predicted for concrete and abstract Ss under the two feedback conditions were present. Two t tests of the difference between means revealed that the persistence of concrete Ss was significantly greater ($t = 2.07$, $p < .025$, one-tailed) under personal than under impersonal feedback, whereas among abstract Ss the difference in persistence between the two feedback conditions was not statistically reliable ($t < 1$). An inspection of the data indicated that the difference in mean persistence between personal and impersonal feedback among concrete Ss was due primarily to the effect of the impersonal feedback condition on the most concrete Ss. Among the seven most concrete Ss receiving impersonal feedback only one had a persistence score above the overall means and none completed all 140 task trials.

TABLE 1

DISTRIBUTION OF PERSISTENCE SCORES

Range	Frequency
0 - 20	13
21 - 40	10
41 - 60	7
61 - 80	3
81 - 100	5
101 - 120	6
121 - 140	32

TABLE 2

NUMBER OF SUBJECTS, MEANS AND STANDARD DEVIATIONS OF PERSISTENCE SCORES UNDER ALL EXPERIMENTAL CONDITIONS

Group	n	$\bar{X}$	S.D.
Concrete-Impersonal	19	67.89	51.92
Concrete-Personal	18	100.39	42.58
Abstract-Impersonal	19	86.21	55.22
Abstract-Personal	20	92.55	55.03

Due to the small sample size persistence scores of the eight black Ss were analyzed only on the basis of persistence under either personal or impersonal feedback. A summary of the data in Table 3 reveals that all four Ss receiving impersonal feedback had greater persistence scores than any of the four receiving personal feedback. An evaluation of the difference between the two feedback groups performed by the Mann-Whitney U Test (Siegel, 1956) indicates that the two groups are significantly different ($p < .03$).

Table 3 about here

Discussion

The results confirm the hypothesis regarding the effect of conceptual structure and type of feedback on task persistence. Among concrete Ss there was significantly greater persistence in the personal feedback condition than in the impersonal. Among abstract Ss the type of feedback appeared to have little effect on persistence. Furthermore, inspection of the data revealed that the strongest differential effects occurred in the case of the most concrete Ss, a finding which is quite compatible with the hypothesis. However, one might also hypothesize in this regard that differential feedback effects will be clearly pronounced and practically significant primarily, if not exclusively, in the case of the most extremely concrete Ss.

It appears, then, that conceptual development, as viewed from Conceptual Systems Theory, does affect responses to feedback. As such, certain directions for future inquiry are suggested. First, the results suggest that the Harvey, Hunt and Schroder scheme may be effectly employed in analyzing reactions to personal and impersonal feedback. Such an application of Conceptual Systems Theory should, among other things, provide a more sophisticated basis for an analysis of feedback effects on middle and lower class children. Furthermore, it might also prove to resolve certain discrepancies in the literature. For example, whereas Zigler and Kanzer (1962) found the predicted interaction between personal-impersonal feedback and social class, this result was not replicated by Rosenhan and Greenwald (1965) and McGrade (1966). Conceivably, one reason for such discrepancy in results lies in the use of the social class variable as a predictor of behavior. Admittedly, social class may be a crude index of certain types of development but certainly it is more logical to explore directly certain indexes of development which underlie but do not necessarily co-vary with social class. One possible such variable is conceptual structure, as defined by Conceptual Systems Theory. The present study indicates that it is indeed related to responses to feedback as the theory would predict. Furthermore, previous research (Hunt and Dopyera, 1966) has shown that although lower class children

TABLE 3

RAW PERSISTENCE SCORES OF BLACK SUBJECTS

$\underline{n}$ = 8

Impersonal Feedback	Personal Feedback
70 (Concrete)	11 (Abstract)
37 (Abstract)	17 (Concrete)
85 (Concrete)	14 (Abstract)
140 (Concrete)	15 (Concrete)

tend, overall, to be lower in conceptual structure than middle class children, there is considerable heterogeneity in the case of the lower class population. Thus it is conceivable that Zigler and Kanzer (1962) Rosenhan and Greenwald (1965), and McGrade (1966) while selecting middle and lower class Ss could have obtained varying samples in terms of conceptual structure, thus obtaining conflicting results. At the very least it is clear that future research on feedback and performances ought to consider underlying developmental variables, such as proposed by Conceptual Systems Theory, rather than crude categorizations such as social class, which may have dubious meaning in any case (cf. Brown, 1965, p. 101 f).

The results with black Ss, albeit with an extremely small sample, may not only be an interesting sidelight to the present study, they may also suggest a bit of caution in disposing entirely of "crude categorization such as social class." The interesting finding in this regard was that blacks had a significantly higher persistence rate under impersonal feedback conditions. This result is consistent with findings by Katz, Henchy, and Allen (1968) regarding performance of blacks when E is white--a situation which was obtained in the present instance. It is not a finding that could have been easily predicted from Conceptual Systems Theory or from previous research on social class effects on motivation. Rather it seems to be irrevocably tied to the phenomenon of being black in America today and must be studied in these terms.

Finally, it may be said that in sum the present study has extended the implications of Conceptual Systems Theory as developed by Harvey, Hunt, and Schroder in such a manner that not only the theory is served but also the solution to problems of general interest is furthered. In particular, the present results suggest a new line of attack on the question of differing responses to feedback, especially in the case of middle and lower class Ss.

Footnotes

1. This paper is based in part on an M.A. thesis written by the first author under the direction of the second author. The authors wish to acknowledge their indebtedness to the University of Illinois Research Board, which provided financial support, and school officials in Danville, Illinois, who assisted in obtaining subjects.

2. The authors are indebted to Mr. J. S. Sweet for assistance in scoring the protocols.

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